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ABSTRACT

One impact of the World Wide Web has been to level the playing field to a certain extent for publishing information by putting authoring and displaying tools in the hands of anyone who wants to use them. The University of California at San Diego (UCSD) Science & Engineering Library has taken advantage of the web's instructional possibilities by creating web-based tutorials to provide users with help materials at their own workstations, on-campus or from a remote location. Hypertext Markup Language (HTML) provides an almost ideal vehicle for tutorials on electronic information systems which require the visual impact of system screen examples, can take advantage of the hypertext nature of the web, and can be used remotely. This paper describes techniques for authoring web-based tutorials, including design concerns, adding graphics and tables, and helpful tips, such as testing HTML files on different platforms, screens, and browsers to look for obvious problems with size, color, arrangement, and overall appearance. Instructions for designing slide shows and adding frames are also provided. (Author/SWC)

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Instruction on the Web: Authoring Tutorials in HTML

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Abstract

One impact of the world wide web has been to level the playing field to a certain extent for publishing information by putting authoring and displaying tools in the hands of just about anyone who wants to play. At UCSD Science & Engineering Library, we have taken advantage of the web's instructional possibilities by filling a need to reach users at their own workstations with help materials. HTML provides an almost ideal vehicle for teaching methods that require visual impact, that take advantage of the hypertext nature of the web, and that can be used remotely.

As a result, I have developed two tutorials authored in HTML using a publicly available screen capture utility, a simple graphics editor and HTML editor software. I used a Macintosh to develop these tutorials, but will show that this approach is easily used in other platforms. There is a relatively short learning curve for constructing these tutorials, and I will show that just about anyone can do it.

One tutorial is a basic introduction to using Netscape, which also covers strategies for finding information on the web. The other tutorial is an in-depth guide to the Compendex online database.

I will share variant design concerns for tutorials, plus some tips and some pitfalls I discovered in the authoring process. I will also discuss using one of the Netscape extensions to HTML to create an automatic slide show that can also be controlled somewhat by the user. Finally, I am developing new versions of the tutorials that use the versatile "frames" feature of Netscape Navigator 2.0.

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Why Web?

Information providers like libraries are poised at the intersection of two eras--the era of the printed word and the era of electronic access. More and more information users rarely step foot inside the library walls, relying instead on an almost exponentially expanding body of digitized information available to them right in the location where they are doing their work.

Systems for accessing information seem to be becoming more user friendly, but most systems still require some instruction for effective use. Libraries in the past have relied on printed documentation and "point of use" guides inside their buildings--but what about meeting the needs of users whose primary point of use is outside library walls? Remote use suggests using remote instruction methods, and the web, in addition to being the delivery vehicle for information, is also especially useful for delivering training.

The visual and hypertext nature of the world wide web makes it a natural avenue for tutoring users of electronic information systems. HTML--hypertext markup language--is a standard method of transmitting information over different computing platforms and is readily accessible by even novice information providers (some would say too accessible!). Online tutorials for computer-based information systems allow easy inclusion of screen examples that can be costly and cumbersome in print format.

This paper discusses several techniques for authoring tutorials for the world wide web, ranging from simple text to more complex graphical methods. Current versions of several tutorials are available at:

Using the Beilstein Handbook
Quick Guide to Compendex on INN-VIEW
Guide to Compendex of INN-VIEW
Netscape Tutorial

The Bare Minimum

It is possible to author training information at a number of levels of complexity on the web. The most basic method is simply to transfer printed guides to the net directly. But even this requires some additional thought -- there is not a 1-to-1 correspondence in just loading the text from printed materials to the web. The two mediums necessitate somewhat different approaches--adapt! The computer screen has different dimensions than the printed page, and you will need to experiment with different layout patterns to get acceptable results. Here are 3 basic approaches:

Just the text, ma'am!

Here is a text handout that was just lifted wholesale onto a web server. No bells and whistles here, but the main message is imparted to the user.

A picture is worth a thousand words --

If you have access to a scanner, you can scan entire handouts or just portions to present your material -- here is a handout scanned and converted to Postscript for downloading (graphic image format) graphics file . This

preserves the graphics and look of your original handout, but doesn't take advantage of hypertext capabilities of the web and, can be difficult for some users since graphic files can be large and time-consuming for users to load and can require loading additional helper software in addition to the web browser software.

Another approach that gives similar results is to use screen grabs from your WYSIWYG word processing program which retain the fonts and formatting of the original document -- here is an image from a Microsoft Word for Mac document using the tables option (more on tables below) for layout, which has been grabbed from the computer screen to a file and converted to a GIF graphics file.

A little more effort pays off --

To get somewhat more functionality, rework a printed guide into HTM L to take advantage of the hypertext nature of the web, and to conform to the screen display requirements -- here is the HTM L version of the scanned document from the previous example Compendex Quick Guide.

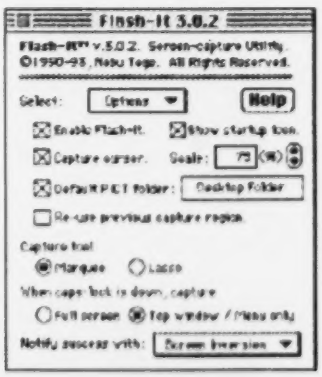
Fancier Stuff

The basic approaches described above will serve a wide range of uses. But, to use more of the capabilities of HTML for tutoring users of computer-based services like online library catalogs, databases or world wide web browsers, for example, graphic examples from actual screens of the applications are invaluable.

First, map out your tutorial using storyboard techniques in a similar manner that you would use for planning a printed guide. What are the pieces of your message and how do they fit together. This is the time to think about hypertext links where they are needed to explain or augment your message. Remember to build in links back to your core information so that the reader doesn't get lost -- hypertext is terrific for branching out, but if you are trying to work your way through a body of material, maintain a logical progression as well.

The Graphics

Generate a script showing what screens you need to copy -- make printouts of these if you can to help you later with editing. Do the screen grabs using utilities like FlashIt for the Macintosh. FlashIt is especially useful since it offers options to capture the whole screen or portions of a screen and write to a file, send to a printer, and to scale the graphic up or down in size by 5% increments.



If you don't have access to sophisticated graphics editing programs, do the screen grabs at 100% if you need to preserve detail in the screen display. Remember that in both VT100 ASCII screen displays and WWW browser screen displays, you can experiment with font size and color on the original screen to get the clearest effect. More on size and color below.

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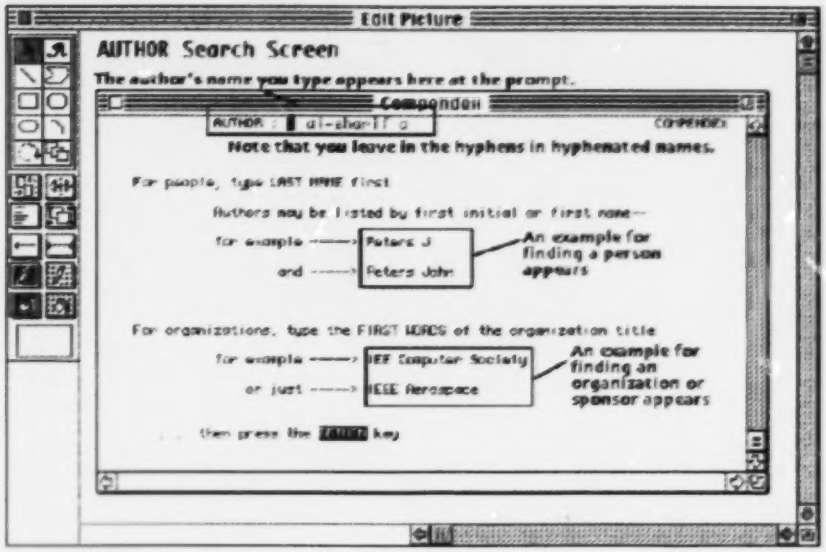
- Edit the screen grabs with a graphics editor to call attention to important points and to guide the user along. For the graphics used in the Compendex database tutorial, I just used the graphics editor that is included with Microsoft Word.


Edit Picture
AUTHOR Search Screen
The author's name you type appears here at the prompt.
Compendex
Note that you leave in the hyphens in hyphenated names.
An example for finding a person appears
An example for finding an organization or sponsor appears

Because I used the Microsoft Word graphics editor, I needed to do additional screen grabs of the edited screen grabs using FlashIt again. If you have access to a more sophisticated graphics editor, this step is unnecessary.

Convert to GIF format using utilities like GIF Converter. This is a shareware program that converts common graphics file formats interchangeably. One nice feature is that it can do "interlaced" GIF files -- these load more easily on the World Wide Web.

The HTML

Once you have prepared the graphics files you need, the next step is to integrate them into HTML files. Even though HTML files are just text files that you can write with any text editor, try an easy HTML editor that allows you to check how your files will look in the browser -- I used HTML Editor written by Rick Giles of Acadia University in Nova Scotia. The newest version provides a template for your HTML file with buttons for easy coding.

There are several excellent HTML guides on the Web: *Spinning the Web*, Eric A. Meyer's *Introduction to HTML*an interactive tutorial, *Beginner's Guide to HTML*. Also remember that you can always copy the source HTML file for pages you especially like, using the "view source" feature of web browsers, and use it as a guide.

The Platform Question

Test your HTML files on different platforms -- Windows, Mac, Unix -- to see any obvious problems. Size, look, color, and arrangement can vary with the same browser on different platforms, with different monitors on the same platform, and with different browsers.

Experiment with different placement of material for best effect.

Remember that the typical PC screen is 640x480 pixels and that some of this space is taken up by the browser control keys and menus. This is particularly important to take into consideration with graphics, tables, and frames. Width is

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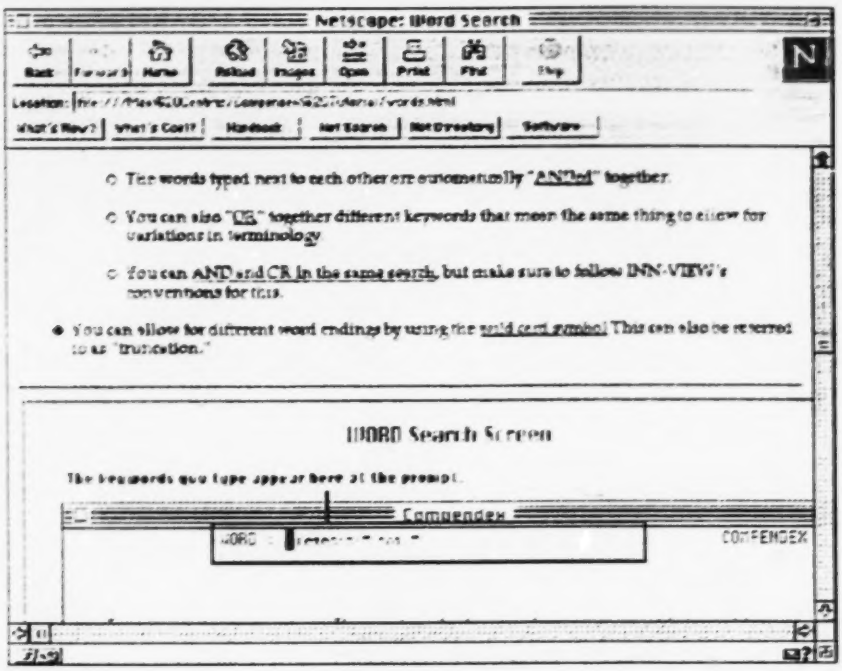
probably more important to consider than height, since most users have no problem with scrolling up and down, but do seem to dislike scrolling from left to right.

Consider this problem of fitting a screen shot graphic as well as explanatory and navigational information on the same screen. The graphic needs to be large enough to be legible, but small enough to accommodate accompanying text.

Here is an early version of a screen explaining how to do a keyword search in an online database, Compendex. Notice that it is annoying to scroll back and forth to view the screen grab graphic and that it is difficult to match the text explanation at the top to the graphic when you can't see the entire graphic.


Netscape: Word Search
Back
Forward
Home
Reload
Images
Open
Print
Find
Stop
What's New?
What's Cool?
Handbook
Net Search
Net Directory
Software
The words typed next to each other are automatically "ANDed" together.
You can also "OR" together different keywords that mean the same thing to allow for variations in terminology.
You can AND and OR in the same search, but make sure to follow INN-VIEW's conventions for this.
You can allow for different word endings by using the wild card symbol. This can also be referred to as "truncation."
WORD Search Screen
The keywords you type appear here at the prompt.
Compendex
WORD
COMPENDEX

Here is a later version of this screen with a smaller graphic that is still legible, but allows the user to match up the accompanying text with the relevant point on the graphic.

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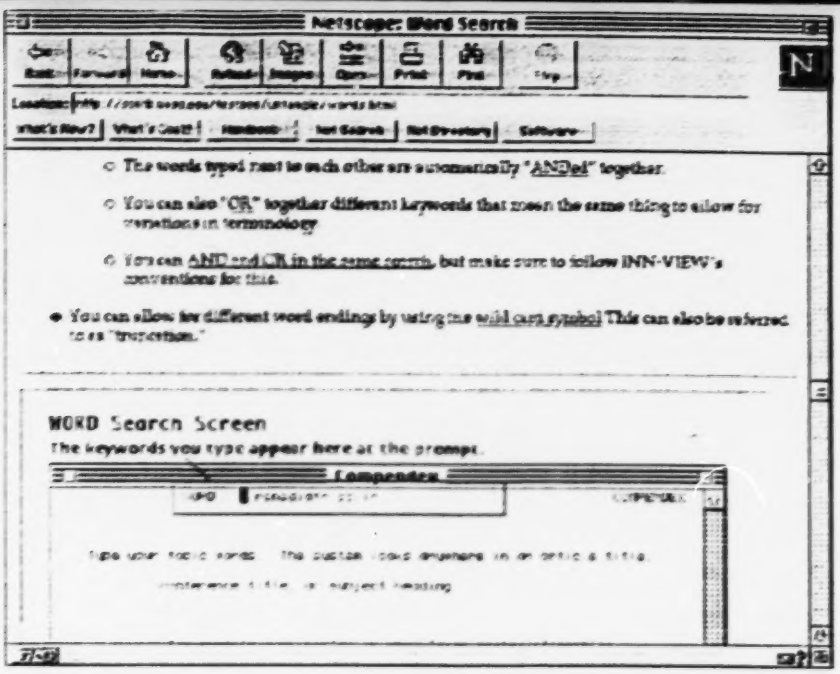
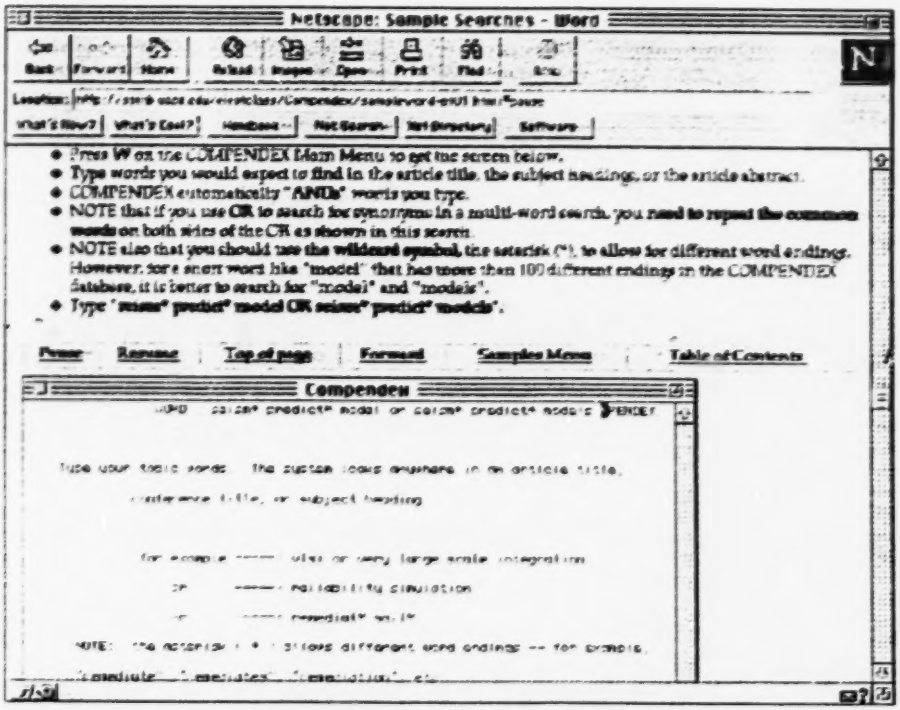


Sometimes a smaller graphic is not the entire solution. Here is an early version of a sample keyword search in the Compendex database that is part of a slideshow (described below). Notice that the navigation bar, which needs to visible as much as possible, also makes it difficult to connect the explanatory material at the top with the graphic below.


Netscape: Sample Searches - Word
Press W on the COMPENDEX Main Menu to get the screen below.
Type words you would expect to find in the article title, the subject headings, or the article abstract.
COMPENDEX automatically "ANDs" words you type.
NOTE that if you use OR to search for synonyms in a multi-word search, you need to repeat the common words on both sides of the OR as shown in this screen.
NOTE also that you should use the wildcard symbol, the asterisk (*), to allow for different word endings. However, for a short word like "model" that has more than 100 different endings in the COMPENDEX database, it is better to search for "model" and "models".
Type 'resin* predict* model OR resins* predict* models'.
Prev
Compendex

Here is a later version that reorganized the navigation bar to the side of the graphic to take advantage of available horizontal space. But now it is easier to connect the explanation with the graphic.

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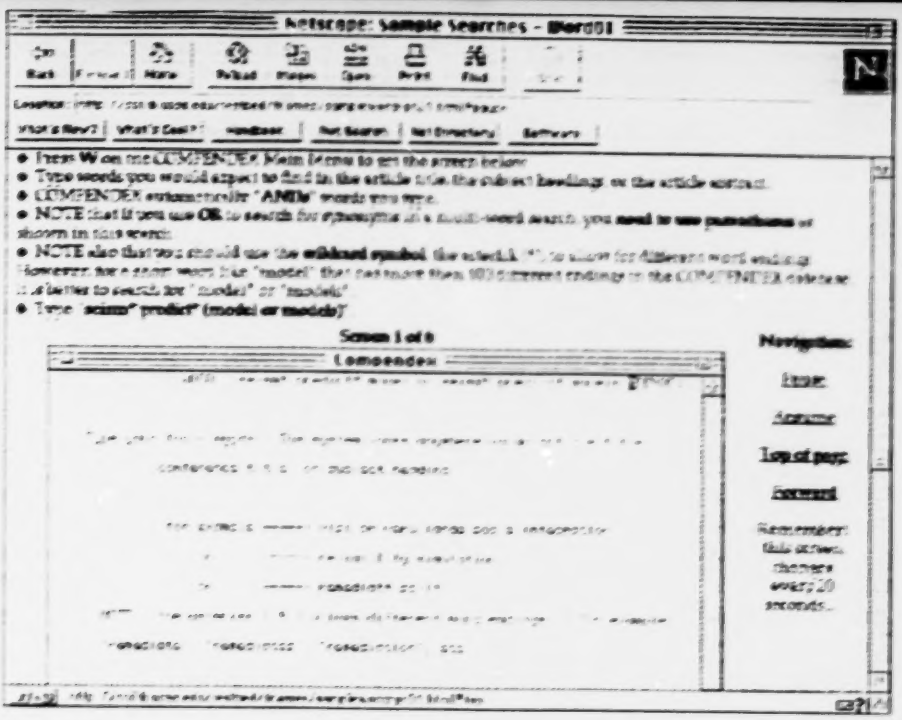
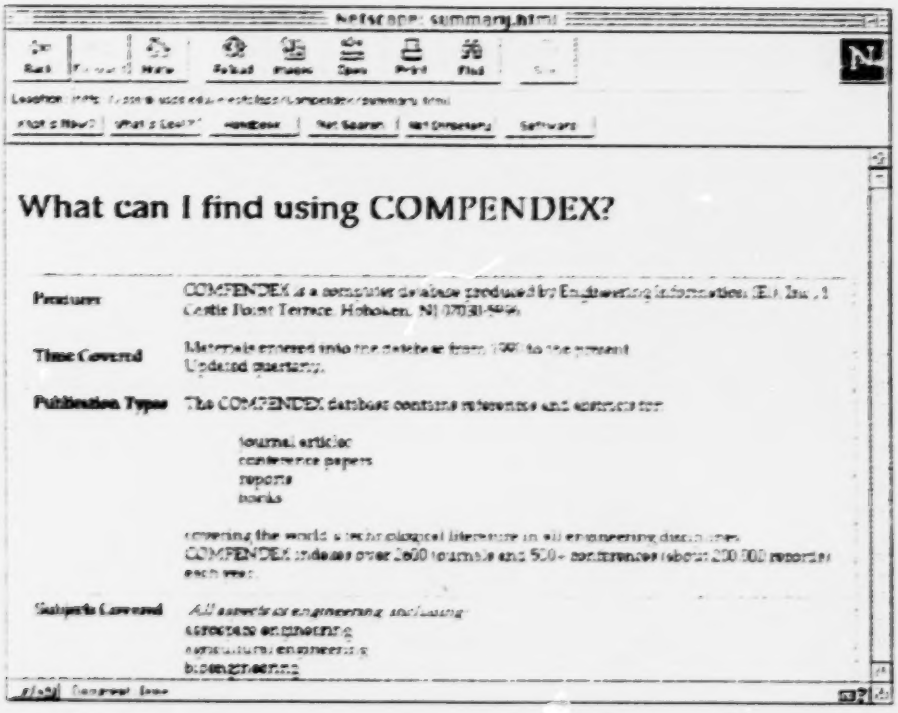


Another technique that can help use all of the available screen space effectively is the "table" feature. Some word processing programs like Microsoft Word and WordPerfect offer table features that are similar to HTML tables. Tables are very useful for formatting data into columns and rows -- with only the space available on a computer screen, this formatting capability can be very useful. Early versions of HTML made displaying tabular or formatted data difficult to display in a compact yet meaningful way. The following screen would be a lengthier list of text without using the table feature. This example uses borderlines in the table, but effective use of tables can be made without borders.



Even Fancier Stuff -- The "Client Pull" Slideshow

A recent HTML innovation by Netscape paved the way for "poor person's" animation -- "client pull." This is what makes the Netscape icon's comets shoot. But you can use this feature to create a rudimentary slideshow for portions of a tutorial where you need to demonstrate a logical progression from screen to screen.

This sample -- Compendex Conference Title Search Demonstration shows one possible implementation of this feature..

Here is how the first few lines of the HTML file for the first slideshow file looks:

```
<html>
<head>
<META HTTP-EQUIV="Refresh" CONTENT="20;
URL=sampleconf-pt02.html">
<title>Sample Searches - Word01</title>
</head>
```

The screens change every 20 seconds -- this is what "Refresh" in line 3 does. The "CONTENT="20;" in the same line is the part of the HTML file that controls the time for refreshing the screen. Notice that this "META" HTML coding is in the heading of the HTML file, just before the title.

Included in the slideshow are links giving the option to "Pause" the screen for more careful reading, to "Resume" the slideshow after pausing, or to go "Forward" to the next screen without waiting 20 seconds. The "Resume" and "Forward" links are just straightfoward links to the current page and the new screens, respectively-- "Resume" restarts the slide show with the screen where you are currently Paused, and "Forward" takes you to the next screen of the slideshow.

The "Pause" link is a little trickier -- it stays in the same file, but goes to a named "target" in the file to keep you from being "pulled" to the next screen. Here is how the HTML for the "Pause" link looks:

```
<A NAME="pause">
<li> Press C on the COMPENDEX Main Menu to get the screen
below.
<li> Type as much of the EXACT conference title as will fit
in the provided space, beginning with the first words of the
title.
<table border>
<tr>
  <TD valign=center align=center width="100%">
  Screen 1 of 3<br>
  <IMG SRC="gifs/SAMPLECONF01.GIF">
  </TD>
  <td valign=top align=center>
  Navigation:<p>
  <a href="#pause">Pause</A><p>
  <A HREF="sampleconf-pt01.html">Resume</A><p>
  <A HREF="#top">Top of page</A><p>
  <A HREF="sampleconf-pt02.html">
  Forward</a><p>
  Remember! this screen changes every 20 seconds...
  </td>
</TR>
</table>
```

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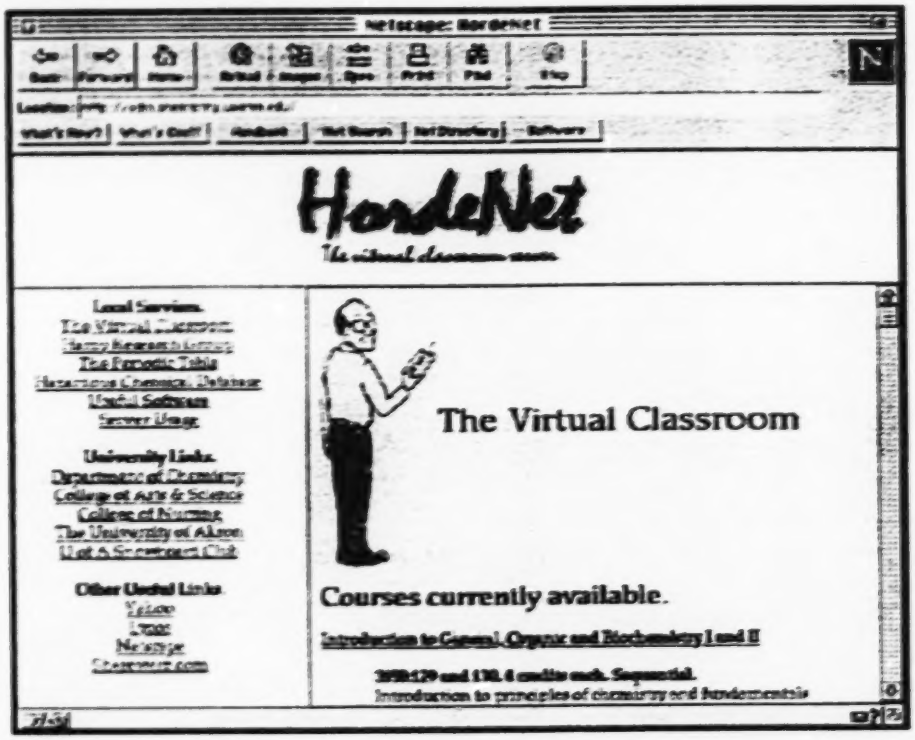
The link for "Pause" -- <a href="#pause">Pause</A> -- looks for the target in the same HTML file -- <A NAME="pause">, and the screen remains until the user clicks on the "Resume" link to reload the current page and

resume the slideshow.

See Netscape's explanation of client pull for complete information about using this feature.

To Frame or Not to Frame

The latest development - frames provided by Netscape 2.0 browser -- allows more control of the screen space. It allows you to divide the screen up into sections containing separate HTML files. A common use of frames is to provide a constant table of contents on screen.



But you can get into trouble with too many frames and illogical links. Use hyperlinks that draw people back or give the option to break out. Also remember to develop a "non-framed" version for users who don't have Netscape version 2.0.

One other caveat about frames -- navigating within a frame works by mouse clicks, not by Netscape's directional buttons. So the users of your tutorial will perhaps need some orientation.

The "framed" version of the Compendex database tutorial's sample search slideshows utilizes a screen partitioned into a small top section containing the navigation (contents) bar for the different types of searches and a large bottom section for the sample search slideshow. Here is a sample screen of one of the framed version screens that is also a link to the live version.

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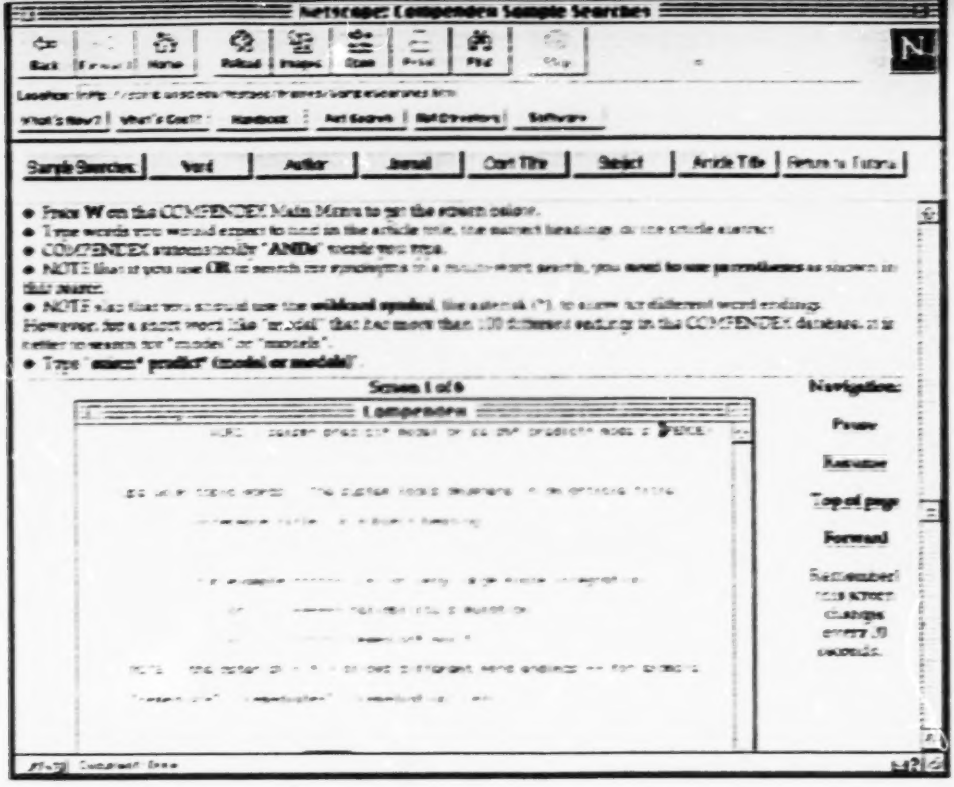

How do Frames work?

The file structure for designing frames uses a master file defining the sections (the "frames") as to position and size. Then the HTML files for each frame contain the data and any links that target displays in other frames. Netscape has a detailed guide on using frames.

Here is the HTML for the master file for the sample conference title search:

```
<html>
<head>
<title>Compendex Sample Searches</title>
</head>
<frameset rows="50,*">
<frame src="searches.html"
NAME="searches">
<frame src="sampleintro.html"
       NAME="screens">
</frameset>
<noframe>
This guide requires Netscape 2.0.  You will find a non-framed
version <a href="/electclass/Compendex.html">here</a>.
</html>
```

Notice that there is no <body> tag in the file. Notice also how the Netscape screen is defined by the <frameset> tags. Then each frame is defined by the <frame src> tags -- the file for the top frame is searches.html, and the starting file for the bottom frame is sampleintro.html. The searches.html file has links that control the files that will appear in the bottom frame.

Here is the HTML for the contents of the top frame -- filename searches.html:

```
<html>
```

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```
<title > </title>
<body bgcolor="#ffffff">
<center>
<img src="gifs/ssbutn.gif">
<a href="sampleword-pt01.html" TARGET="screens">
<img border=0 src="gifs/wordbutn.gif"></a>
<a href="sampleau-pt01.html" TARGET="screens">
<img border=0 src="gifs/aubutn.gif"></a>
<a href="samplejrnl-pt01.html" TARGET="screens">
<img border=0 src="gifs/jrnlbutn.gif"></a>
<a href="sampleconf-pt01.html" TARGET="screens">
<img border=0 src="gifs/confbutn.gif"></a>
<a href="samplesubj-pt01.html" TARGET="screens">
<img border=0 src="gifs/subjbutn.gif"></a>
<a href="sampletitle-pt01.html" TARGET="screens">
<img border=0 src="gifs/artlbutn.gif"></a>
<a href="/electclass/Compendex.html" TARGET="_top">
<img border=0 src="gifs/retybutn.gif"></a>
</center>
</body>
</html>
```

Notice that the links are targeted to the bottom frame by TARGET="screens" tags. Notice also that the target for the last link is "TARGET="_top", which is the frame code for exiting the frame. This link takes you back to the table of contents of the tutorial.

What Does the Future Hold?

Medium Tech Advances

Many web information providers are making their tutorials and other information available in Adobe Inc.'s Acrobat "portable document format" (PDF). Adobe offers that Acrobat Reader software available free for downloading, but markets the file creation and conversion software -- Acrobat Exchange and Acrobat Distiller (educational price for the package is around $150). PDF easily integrates text and images and is available for all major platforms. Printing a PDF file can be done with excellent results on laser or deskjet printers.

Higher Tech Future

The wave of the future seems to be in software that includes runtime versions of software that are downloaded to the users' machines along with the data -- Shockwave and Java. This technology is available now on a few platforms and is expected to become more widely available.

As with much of technology, this development is both a blessing and a curse. It makes more sophisticated interactions possible via the world wide web, but requires the author to be conversant with programming techniques and languages beyond simple HTML.

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